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Are We Getting Value for the $8 billion?

NIH Crowd Seeks New Ways Out of Money Crunch

When it comes to policy innovations, the NIH establishment has been in a long drowse interrupted only by its chants of "More money." But an awakening is in progress.

Some relatively bright and brazen policy ideas are circulating among the traditional chieftains, beneficiaries, and cheerleaders of the world's greatest, and weepiest, biomedical-research enterprise. Whether these notions will be turned into policy is a separate matter. But the potential for change directly correlates with the degree of pain, and that is surely rising throughout the biomedical enterprise.

The impetus for new thinking is the slowly arrived-at realization that a great flood of money will not be forthcoming to float NIH away from its troubles. At the moment, the most groused-about problem is NIH's self-inflicted wound of longer and longer grant durations that mortgage the future to the detriment of newcomers to biomedical research. But the system is financially stretched thin in virtually all its parts.

The immediate barrier to fiscal relief is the sad state of federal finance. But far more important is that, relative to other government responsibilities, Washington has been extraordinarily good to biomedical research, raising its budget from $4 billion in 1982 to $7.5 billion in 1990, a purchasing power increase of nearly 50 percent. Congress remains sweet on NIH, but on Capitol Hill and elsewhere heretical questions are being raised about whether NIH is making the most of all those billions.

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The prevalence of interest in such matters was perhaps the most striking aspect of an open meeting June 27 at the Institute of Medicine, the health-policy wing of the National Academy of Sciences. Titled "Forum on Supporting Biomedical Research: Near-Term Problems and Options for Action," the gathering of over 300 had the earmarks of another *kvetching* marathon of NIH clients and their friends. There was plenty of that, in the customary sagas of unrequited grant applications and miserly funding rates—often expressed in the hallucinatory doomsday rhetoric that serves as the language of public discourse for otherwise calm people in the biomedical sciences.

For example, Leon Rosenberg, Dean of the Yale University School of Medicine, proclaimed at the meeting: "Our nation's health-research program is burning. For those of

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In Brief

This is the season of calculations of what happens if Congress and the White House don't achieve a deficit reduction. The Gramm-Rudman budget shredder then comes alive, cutting next year's defense budget by 25.1 percent and non-discretionary domestic spending by 38.4 percent. Such cuts would wipe out thousands of research grants and freeze many big projects, including the space station and Superconducting Super Collider.

The likelihood is that a deal will be struck, but SGR's infallible Congressional-staff budget wizard predicts that research funding will nonetheless get whacked, and more severely than usual. The research budgets in the legislative mill are headed for real growth, but then they'll all be required to give some of it back for deficit-reduction. Our source foresees a takeback of at least five percent.

James Watson, impresario of NIH's National Center for Human Genome Research, has a rejoinder for critics of "big science." Speaking in Washington July 18, he said, "It is lunacy to say you can replace money with genius." He faces a chance to test his thesis. The House Appropriations Committee voted a week earlier to provide only $66 million of his $103 million request.

Recognition as a policy thinker, a la the editors of The New England Journal of Medicine *and* Nature, *continues to elude* Science *Editor Daniel E. Koshland Jr., notable for keen self-appreciation of his low-incandescence editorials. So, on at least two occasions, Koshland has invited in the Washington science press for a first-hand luncheon look at the capital's Cinderella of science policy. An attendee at the latest soiree, June 26, later rolled his eyes upward and expressed admiration for the invitees who did not attend.*

Sam Nunn, meet Sam Nunn, Chairman of the Senate Armed Services Committee. On June 28 he urged assignment of environmental duties to the Pentagon's budget-crimped research empire. Nunn said the Defense bill would authorize "creation and funding of a Strategic Environmental Research Program which would be administered by a new Defense Environmental Research Council." A week earlier Nunn strongly backed a bill to eliminate earmarked funds for universities. "One strength in our national research program has always been the competition that exists between universities," Nunn wrote, adding: "Where our university research should be performed must be decided on the basis of merit judged by those best qualified to decide, not on the basis of specific earmarking through the legislative process."

. . . Bromley Skeptical About Peer-Review Grades

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you in Washington who are unable to see the flames, I say wake up and open your eyes. For those of you who can't smell the smoke, I say please blow your nose and inhale again." And so on.

A more restrained approach was taken by D. Allan Bromley, the President's Science Adviser. He conceded and lamented the inadequacy of funds for many promising researchers, and said he hoped for relief in the budget now in preparation for submission to Congress early next year. But Bromley also suggested that NIH's managerial practices may be magnifying the difficulties of biomedical research.

"Current practices also raise some rather troubling questions about the peer-review process," he said. The quality of proposals has undoubtedly improved, Bromley agreed. But the quality factor, he said, is an improbable cause of the "increase from an average of less than 70 percent of proposals being judged excellent a few years ago to what is now happening in a great many study sections, where the number so judged exceeds 95 percent. And one cannot help suspecting," Bromley suggested, "that sympathetic reviewers are attempting to lend a hand to young people in the community whom they feel need all the help they can get."

Bromley also pointed out that "NIH represents 40 percent of the federal budget for non-defense R&D and accounts for half of all federal support for basic and applied research in the nation's colleges and universities. In the absence of greatly increased funding," he asked, "how can NIH justify a larger share of the total pie? It's a question that must be answered," he advised the audience.

David Baltimore, the new President of Rockefeller University, harmonized with the meeting's penchant for self-pity by making the preposterous assertion that universities are "treated by the federal government as mendicants who should really fend for themselves but are handed crumbs out of a sense of charity." But then he proceeded to offer several penetrating and useful observations.

Offering the judgment that the Howard Hughes Medical Institute has produced an "enormous impact" through its spending—now about $225 million a year—on biomedical research, Baltimore asked, "Why can so little money have a disproportionate result?" He said he had no answer, but the question led him to wonder "whether all of the available money from NIH is spent as well as it might be."

Baltimore noted, too, that the statistical information "available about biomedical-research funding is wholly inadequate," stating that "we need a much clearer picture of where NIH money is going because we do not seem to be getting $8 billion worth of bang for the $8 billion being spent." He pointed out that "the number of new departments and even new institutions seems to have continued to grow," which led him to ask: "How much growth in biomedical research personnel is needed and how much is healthy?"

Asked in a question period to amplify his remarks about the return from NIH spending, Baltimore said, "I think everybody is struck by the fact that there are people and programs throughout the country that often are not at the absolutely cutting edge of their fields. When you look into why, it turns out that they are funded through mechanisms quite different from the standard RO-1 mechanism [the competitively awarded NIH grant for individual investigators]."

The situation merited an inquiry, Baltimore said, but he added that "NIH itself could never investigate that question because it involves making quality judgments that would probably be inappropriate coming from NIH and could only come from an external group investigating the issue."

Pungent observations about NIH's university clientele were provided by an NIH researcher and administrator, Joel Schindler, of the National Institute of Child Health and Human Development. "In my recent experience at NIH," he said, "I have developed a sense that there is an enormous institutional arrogance about what NIH should in fact be providing to institutions, almost to the point where institutions view NIH funding as an entitlement program, where they simply provide grant proposals and applications and NIH provides them with money.

"There has been very little institutional responsibility from my perspective," Schindler continued, "as to what kinds of demands are being made on NIH and what types of issues should . . . be supported with NIH institutional funds. I can point out for you, in fact, several examples of tenured full professors with 100 percent of their salary currently underwritten by NIH grants. Does this imply that in fact they do nothing for the institutions that employ them and, if so, what in fact are they doing at such institutions?"

Schindler continued picking at this embarrassing sore point, which is well known within the NIH culture but rarely discussed in public. "I can also point out," he said, "that a full professor getting 100 percent of his salary off an NIH grant can . . . support two assistant professors getting an

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. . . Limit NIH to Basic Research, Merck Head Says

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equal amount of money off an NIH grant."

A reordering of NIH spending priorities was recommended by Roy Vagelos, Chairman and CEO of Merck and Co. More money is needed throughout the NIH system, he agreed, but since big growth is beyond political reach, investigator-initiated projects should take precedence in the budget. And, he said, "I would put at the bottom applied research in universities and, within the Institutes, targeted research." He noted, "There is a lot of money in the United States and the rest of the world for doing applied research."

Vagelos asserted that "clinical research of drugs should be left to industry, except under national emergencies or where there are studies that just don't make financial or commercial sense . . ."

Even more radical shifts in biomedical affairs were suggested by Theodore Cooper, Chairman and CEO of the Upjohn Co., formerly Director of the NIH Heart and Lung Institute, Assistant Secretary of Health, and Dean of the Cornell University Medical School. Cooper, who missed the earlier sessions of the meeting, correctly speculated "that you spoke very little about the idea that the [NIH] system as it is currently structured has any intrinsic deficiencies." He went on to urge "some serious thought" that it does, noting that NIH has traditionally relied on academic institutions, "rather than make a network of free-standing research institutes or some other alternative that [might] have been done. It is possible," Cooper continued, "that the yield curve for that investment by the current distribution system is diminishing. In fact, the evidence for that is the emergence of different forms of research apparatuses that are being embraced by many of you"—apparently a reference to specialized institutes within or adjacent to universities and academic-industrial collaborations.

Cooper contended that the "golden age of NIH had a few deficiencies," among them "an attitude of moderate and sometimes not so moderate contempt for industrial or commercially sponsored research. This approach," he said, "helped to decouple research from product development to a degree that has made exercising all the options to strengthen biomedical-research capacity more difficult."

Cooper continued: "We are all aware now that compromises with companies, at least the successful ones, are desirable for the simple reason that they have money that might be used for research, even in academic and non-profit locations." Referring to various formats for industrial ties with university-based research, Cooper noted the existence of "companies inside the university funded by venture capital or joint participation by a genuine company outside, with either the principals who do the research or the academic institution itself.

"I am sure," he told the audience, "that many of you have contemplated such a research organization forum within your academic structure. In fact, I have it on pretty good authority that a few major research academic institutions are studying how to do it and what it might mean for their independence, their credibility among you all, their tax status, and, indeed, their cash flow."

Cooper concluded by cautioning that the political and financial conditions that helped foster NIH's rapid growth of federal support had undergone important changes. Today, he said, "The issue is who should provide a fix. What would the researchers do differently, as well as the companies in the private sector, or the health-care system, or the Congress . . .? If your position is nothing should change, then I think you are outlawing the responsible fix to the situation.

"Universities, the Federal research institute, the private foundation, the government in general, and the private sector cannot translate new knowledge into economic strength by themselves. No sector can do that. This is a different concept that we are facing right now," Cooper declared.

Did the speakers register with their expressions of skepticism about NIH's cost-effectiveness and their urgings of innovativeness and flexibility in dealing with the fiscal plight of biomedical research? Perhaps. But it is to be noted that near the conclusion of the meeting a member of the audience arose to declare that "I'm a little disquieted by what I consider to be a patchwork of temporary expedience, when the real problem is we need more money." The audience responded with solid applause.—DSG

(The Institute of Medicine plans to publish a summary of the proceedings, but not a full transcript, which is too bad, since more of importance to the biomedical community was said than SGR can accommodate. Notice will be given here when the summary is available.)

More Money, Slap for NIH

The House body that counts most in the fiscal fortunes of NIH has responded with stern paternalism to the cries of crisis in biomedical research. While endorsing a budget boost of about $1 billion over this year's figure, and $700 million above the President's request, the Appropriations Subcommittee for NIH said it "believes this crisis has been overstated."

It agreed that NIH suffers from budgetary woes that have led to trimming existing grants and a downturn in new grants. But it said NIH had contributed to the problems by increasing the size and duration of awards "without regard to the amount of funds which are available in a particular year." The Committee also cited peer-review grade inflation as contributing to the perception of crisis. NIH was told to implement "more aggressive cost management," including a four-year average length for grants and cost-increase limitations tied to the biomedical-research deflator index. Perhaps as a pointer, $34 million was trimmed from the $103 million sought for the human-genome program.

Man-in-Space: The Self-Inflicted Curse of NASA

The teetering space agency needs another diagnostic exam like it needs more leaky Shuttles or blurred telescopes. But when presidents seek to duck the risks of assertiveness, they traditionally order a study. And that's what George Bush has prescribed for NASA, rather than acknowledge that the space program is weighed down by a burdensome, dispensable cargo: The monumental costs of humans in space, easily replaced by robots and instruments.

Nonetheless, astronauts are foolishly revered in the NASA ethos as crucial for maintaining public interest in space. The result is a NASA that runs threadbare, even as the White House and Congress pile on additional billions to maintain the romance of manned Shuttles and a manned space station.

The newly ordered presidential study arises from NASA's recent run of extravagant flops after a protracted though seemingly successful recovery from the Challenger disaster. But then came the debacle of the $1.5 billion Hubble Telescope. It was sent aloft with a disabling optical flaw that went undetected because hardpressed NASA spared itself the testing costs of several million dollars. An encore was provided by the grounding of the Shuttle fleet because of mysteriously leaking fuel valves that raised the specter of another Challenger catastrophe.

These embarrassments occurred while Congress was once again hearing that the centerpiece of NASA's efforts for the 1990s, the manned space station, would cost many more billions than the most recent estimate—which was many more billions than the previous estimate. Initiated by Ronald Reagan in 1984, the space station has soared on hallucinatory cost estimates that started at $8 billion and are up to $37 billion.

In fact, no one can reliably say what it will cost or whether it can actually be built, since its construction depends on the lift capacity of the trouble-plagued Shuttle. Despite this uncertainty, the Bush Administration has gone beyond the space station and declared its commitment to a Moon-to-Mars manned voyage, for which the cost estimates are in the hundreds of billions—but how many hundreds, no one knows.

The political dynamics of Mars involve Vice President Dan Quayle, Chairman of the National Space Council. Scratching hard to put his name on something, Quayle has reached out to space—which is about the only area in which he occupies a policy role, as tenuous as that might be. Bush has given him a long leash on this one, since expenditures required at present are relatively small and the big bills won't come due until early in the next century.

Though over $4 billion has so far been spent on the space station, it exists only as a paper design, and with virtually no purpose beyond serving as a platform for the glamour of man in space. Nonetheless, the venture has soured relations with the European, Canadian, and Japanese space agencies that NASA signed up as partners. After the foreign participants had spent several billion dollars on the design of facilities that could link up with the space station, NASA unilaterally scaled down the venture to save money. Among the items cut back was the electric-power supply for the foreign hardware.

Legitimate howls of betrayal led Bush's Science Adviser, D. Allan Bromley, to declare publicly that the U.S. must strive to be a "more reliable partner" in international high-tech collaboration. But not long after that, NASA, citing financial pressures, pulled out of a collaborative program to put a Franco-American research instrument on a Soviet satellite.

The villain in this tortuous succession of space follies is NASA's commitment to a manned space program, for which the rationale is keyed to public relations rather than technological necessity. Men and women are delicate and costly cargo in space, requiring huge expenditures to assure their safety. They possess the unique capacity to "Ooh" and "Ah" about the wonders of space travel, but when it comes to getting work done, robots and instruments are cheaper and more reliable. If they fail to return, the nation does not mourn.

The curse of the space program is that when it is capable of technological maturity, it remains dominated by the circus spirit of the moon-landing project of the 1960s. It was concern about drooping public attention that inspired NASA to put a school teacher, Christa McAuliffe, aboard the ill-fated Challenger. Prior to the explosion, NASA drumbeaters ebulliently characterized the Shuttle as a routinely operating space transportation system, which it never was and never will be.

The new presidential study is to be conducted by outside experts selected by NASA—which leaves little hope for cutting through to the source of NASA's woes. But if the committee wants to take the rogue route, make history and save NASA, it need only point out that humans in space are a costly nuisance that the space program can no longer afford.

Rocky Start for Space Study

The latest inquiry into what ails NASA got off to a contentious start last week when the selection of a Chairman, Norman R. Augustine, head of Martin Marietta, was announced by Vice President Dan Quayle, and denounced as inappropriate by Senator Albert Gore (D-Tenn.), Chairman of the Senate Commerce Subcommittee on Science, Technology, and Space. Gore praised Augustine, but demurred on the grounds that his company is a big NASA contractor.

Quayle is in the picture as Chairman of the National Space Council, a role that provides one of his few opportunities to develop a political identity. With the NASA brass regarding Quayle as a meddling nuisance, the study is not destined to proceed smoothly.

Whitten Factor Retards Agriculture Grants Program

While NIH is choking on the rigors of its competitive-grants system, the long campaign to expand such misery to agricultural research continues to make only limited headway.

The reason, of course, is Rep. Jamie L. Whitten, the 80-year-old Democratic Mississippian who chairs the House Appropriations Committee and its Subcommittee for Rural Development, Agriculture, and Related Agencies. He's held the latter post for 30 years, and because of his tandem chairmanships and legislative wile, is a powerful baron on Capitol Hill.

Though not totally rigid, Whitten is attuned to the old ways of funding ag research, ie., through block funding to established labs and research groups, a method free of the cutthroat zero-sum face-offs now spreading despair in the biomedical sciences. He favors research that's visibly related to everyday needs of the farmer, such as pesticides research on specific bugs in a specific region. He does not rule out long-range, basic research, but it's not his first choice.

Whitten has tolerated no more than slow growth in the long campaign to add a competitive sector to the grant awards of the Cooperative State Research Service (CSRS) in the US Department of Agriculture. He's allowed a few millions in growth per year, to the point where the competitive budget now receives $42 million of the CSRS's $337 million budget. But he has successfully resisted pressures for more rapid growth.

The case for growth came mainly from outsiders who contended that agricultural research had receded into an intellectual backwater, remote from the techniques and developments that have elsewhere revolutionized the life sciences. With high hopes and characteristic political ineptitude, the Carter Administration initiated the competitive program. Whitten saw to it that the startup years were difficult and slow and that the program never broke into the big money.

The Bush Administration, backed by yet another pro-competitive study from the National Academy of Sciences (*Investing in Research: A Proposal to Strengthen the Agricultural, Food, and Environmental System*), hopes to change that. But Whitten still controls the throttle. The platform of the hoped-for growth is the Agricultural Research Initiative, announced last year, which calls for increasing the competitive grants program to an astronomical $500 million over the next decade. The first step, written into the fiscal 1991 budget, called for $100 million next year. But when the Appropriations Committee returned its verdict, on July 13, the Whitten factor was again evident. The Presidential request called for going from the current $42 million to $100 million. The Subcommittee recommended $73 million, a figure endorsed by the full Committee and passed by the House on July 18.

In a report accompanying the appropriation, Whitten's Subcommittee indicated it's maintaining tight reins on the competitive program. Noting the federal budget crunch, it urged, though did not require, the Agriculture Department "to work with applicants for competitive grants to develop matching funds from non-federal sources," cautioning that "the need for matching funds will take on increasing importance." The Subcommittee also directed USDA to "submit a summary of each grant proposal as it is approved, as well as a summary of what each completed grant has accomplished." Cruelest of all, the Subcommittee hit the grant system in one of its most vulnerable parts, indirect costs. Last year, it limited these payments to 25 percent of direct costs, which is about five percent below the current average at NIH. This time, it decreed that indirect costs on competitive grants "should be brought more in line with special grants and other USDA programs. To accomplish this," the report states, "the Committee has reduced the allowable rate from 25 percent down to 14 percent, the same rate used by the Agricultural Research Service."

Job Changes & Appointments

Appointed to the President's Foreign Intelligence Advisory Board: ***Lew Allen Jr.***, Vice President of Caltech; ***William J. Perry***, a former chief of research at the Pentagon, in private business in California, and ***John M. Deutch***, Provost, MIT. Other members: former Senator ***John Tower***, who was appointed Board Chairman; retired Admiral ***Bobby Inman***, former head of the National Security Agency, and ***William G. Hyland***, Editor of *Foreign Affairs*. The six appointees are a new crew for a whittled-down version of the Board, which formerly numbered 15, mostly Reagan holdovers. The Board is supposed to serve as the President's watchdog over intelligence activities.

Jesse Roth, Scientific Director of the NIH National Institute of Diabetes and Digestive and Kidney Diseases, has been appointed Chief of the Division of Geriatrics and Gerontology at Johns Hopkins School of Medicine. He will also serve as Deputy Scientific Director for Program Development at the NIH National Institute on Aging. Roth has been with NIH for 27 years.

Michael J. Jackson, Dean for Research and Professor of Physiology, George Washington University Medical Center, has been appointed Executive Director of the Federation of American Societies for Experimental Biology.

Christoph von Arb has been appointed Science and Technology Counselor at the Swiss Embassy in Washington, succeeding ***Hans Peter Hertig***, who has been assigned to the S&T post at the embassy in Brussels. Von Arb, a biologist, is currently with the *Schweizerische Wissenschaftsrat*, a science-policy research organization.

Lajos Nyiri has completed a four-year term as Science and Technology Attache at the Hungarian Embassy in Washington. He will be succeeded by ***Istvan Mezei***.

Former Director of NIH Finds Job Market is Strong

Perturbations in the national employment statistics may be attributable to the recent vocational movements of James B. Wyngaarden, Director of the National Institutes of Health from 1982 to 1989, and for a brief time after that, Associate Director for Life Sciences in the White House Office of Science and Technology Policy (OSTP).

Since July 1, Wyngaarden has been serving concurrently as (1) Foreign Secretary of the National Academy of Sciences; (2) Associate Vice Chancellor for Health Affairs at Duke University, and (3) Director and Chief Executive Officer of the Human Genome Organization, an international association of some 240 genome researchers, with offices in Bethesda, Md., London, and Osaka.

Wyngaarden was forced out of NIH last August when the newly arrived Bush Administration said it wanted its own appointee at the helm there, though it still hasn't landed one. White House Science Adviser D. Allan Bromley then recruited Wyngaarden for the job of Associate Director for Life Sciences at OSTP. Because of a log jam in the Senate, Wyngaarden wasn't confirmed for the OSTP post until last December, though prior to that he served parttime on a consulting basis.

Meanwhile, with Bromley's approval, Wyngaarden became a candidate for the position of Foreign Secretary of the National Academy of Sciences. In the hands of some predecessors, that has been an important and demanding job, though it's on the books as a half-time position. Winning the election, Wyngaarden resigned from OSTP June 30 to take the Academy post July 1. On that day, he was appointed Associate Vice Chancellor for Health Affairs at Duke University, where he was Chairman of the Department of Medicine from 1967 to 1982, when he went on a long leave to head NIH. As a young researcher at NIH and later at Duke, Wyngaarden was a leading researcher on inherited biochemical defects, and has served as co-editor of a standard work in the field, *The Metabolic Basis of Inherited Disease*.

According to an announcement from Duke, Wyngaarden will devote 25 percent of his time to academic duties that include "issues of long-range planning, curriculum design, biomedical research policies and technology transfer, as well as some teaching."

At about the same time, announcement was made of his appointment to the Human Genome Organization. It's an independent organization, but the wherewithal of its researchers comes mainly from NIH, where the genome program was started during Wyngaarden's regime.

While NIH's clients are making an unprecedented uproar about the inadequacy of financial support, the Duke announcement of Wyngaarden's appointment quotes him as saying: "We were able, with the help of the Administration and the Congress, to double the budget for biomedical research—to achieve a 40 percent growth in real terms. A considerable amount of the money went to the AIDS effort and some to initiating the human genome project, but every institute in the National Institutes of Health grew."

The budgetary description is correct, but in Washington science-policy circles, lively argument can be easily aroused on how it happened and whether Wyngaarden contributed to the results or just happened to be there. The existence of doubts is a sensitive point with the former NIH Director.

Search Goes on for an NIH Chief

The long-vacant NIH Directorship is still stumping the Bush Administration, which early in the search repelled a flock of top candidates by letting Assistant Secretary of Health James Mason loose with a "litmus test" on abortion.

Mason's boss, Louis Sullivan, the Secretary of Health and Human Services (HHS), subsequently tried to pacify the offended mandarins with assurances that professional ability alone was the only criterion for the job. But the swatless Sullivan is no match for the right-to-life zealots whom the White House installed to manage the workings of HHS. Mason demonstrated that by declaring and then reaffirming the restrictions on experimentation with aborted fetal tissue.

From time to time there are reports around Washington of this or that senior medical administrator saying "No, thanks" to an offer of the NIH job—including a recent one that says George Bush himself got a brushoff when he personally solicited a candidate. The vacancy at NIH has become a festering issue in Washington biomedical circles. The soreness is intensified by puzzlement over what's happened with the recommendations of the Advisory Committee on the National Institutes of Health, appointed last year by Secretary Sullivan.

Its task was to suggest ways to beef up the authority and prestige of the NIH Director, who currently has almost none of the former and only as much of the latter as he can develop himself. The committee members have not heard a thing since they submitted their recommendations following a final meeting last April. One of them recently expressed great annoyance about the silence from HHS, and also agreed with the grapevine assessment that as long as Mason is Assistant Secretary of Health, the half-dozen biomedical luminaries sought by the Administration will happily retain their present jobs.

A strong and experienced candidate is easily available, but the biomedical culture can't face the prospect. On board as Acting Director is a veteran of NIH, William Raub, who stepped up from the post of Deputy Director when Wyngaarden departed. Raub's handicap is that he's a PhD in an institution that has always been headed by an MD.

Despite the diminished authority of an acting appointment, he's been running the place very well. The powers who have been mucking up the appointment should consider that Raub is there, now. A newly appointed outsider will require long seasoning to attain maximum performance in the capital's biomedical jungles.—DSG

In Print: *New Jersey's S&T Booster; Global Environment Governance Effects of "Sin" Taxes; Tracking World Science; Grant Swinger*

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groups, but the foreign survey was concentrated on IEEE affairs. The survey was conducted and analyzed by Westat, Inc., a Rockville, Md., consulting firm.

Order from: IEEE Service Center, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331; tel. 1-800/678-IEEE or 201/981-1393.

Coming of Age (32 pp., no charge), 1990 annual report of the New Jersey Commission on Science and Technology, among the biggest of the many state agencies boosting S&T for economic growth. The program supports research centers for biotechnology, advanced materials, "telematics," and environmental protection technologies. Annual state funding is currently $25 million and non-state sources are providing $40 million, according to the report.

Order from: New Jersey Commission on Science and Technology, 122 West State St., CN 832, Trenton, NJ 08625-0832; tel. 609/984-1671.

Lessons Learned in Global Environmental Governance (60 pp., $13), from the World Resources Institute, Washington-based policy-analysis organization, a review of international efforts aimed at environmental goals, by Peter H. Sand, Senior Environmental Affairs Office, UN Economic Commission for Europe. Sand says that the existing international environmental agreements and agencies are often cumbersome and keyed to standards that "tend to reflect the lowest common denominator—the bottom line." But noting that they are in place and functioning, he adds that their "openness and adaptiveness to change" should be utilized for developing "new institutional arrangements for environmental governance." The author points out that "the most serious drawback of the treaty method is the time lag between drafting, adoption, and entry into force of standards. The average 'tempo of acceptance' for multilateral treaties is about five years."

Order from: WRI Publications, PO Box 4852, Hampton Station, Baltimore, Md. 21211; tel. 301/338-6963.

Federal Taxation of Tobacco, Alcoholic Beverages, and Motor Fuels (128 pp., no charge), by the Congressional Budget Office, a review of data on the economic, health, and social effects of taxation on smoking, drinking, and driving. Included are sales-tax rates in the 50 states and in the 24-nation Organization for Economic Cooperation and Development. Good background for the coming tax debate.

Order from: Congressional Budget Office, Publications, 2d and D Sts. SW, Washington, DC 20515; tel. 202/226-2809.

Indicators to Measure Internationalization of Science (29 pp., no charge), a tracking of trends in international collaboration among researchers in eight major disciplines in 72 nations during 1981-86, using data from Science Citation Index. Among the major findings: Japan is rapidly expanding cooperative scientific ties with Asian neighbors and with Western Europe. The study was conducted by Jean-Francois Miquel, Director of the French *Laboratoire d'Evaluation et de Prospective Internationales*, who recently concluded a visiting appointment at the Congressional Office of Technology Assessment, and Yoshiko Okubo, a graduate student at George Washington University. Miquel's laboratory is part of the French cousin of NSF, the *Centre National de la Recherche Scientifique*, where he formerly was Director of International Relations. A review of the findings was presented last month at a conference of the Organization for Economic Development and Cooperation.

Order from: J-F Miquel, Directeur, Laboratoire d'Evaluation et de Prospective Internationales, 295, rue St. Jacques, 75005 Paris, France; tel. 43.29.30.89.

The Grant Swinger Papers (Second Edition, 40 pp., $8.95 per copy, three for $25; add $2 for foreign orders), by SGR Editor Greenberg, interviews with Dr. Grant Swinger, the legendary Director of the Center for the Absorption of Federal Funds, plus commentaries by Dr. Swinger and other material. Among the titles are "Let's Hold a Conference," "Overhead and Underhand: The Realities of Research Funding," "On the Origins of NASA," and "Cold Fusion and Other Matters." The contents originally appeared in various publications, including SGR, *The New England Journal of Medicine*, *Science*, and the *Washington Post*.

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SGR Summer Schedule

The next issue of *Science & Government Report* will be published September 1, 1990.

In Print: *S&T Info and Competition; Forest Service Planning; Protecting Electric Systems; DOE Research Priorities; IEEE Member Survey*

The publications listed are obtainable as indicated—not from SGR.

Helping America Compete: The Role of Federal Scientific and Technical Information (GPO Stock No. 052-003-01196-4; 68 pp., $3.75), from the Congressional Office of Technology Assessment (OTA), prepared at the request of the House Science, Space, and Technology Committee, says indifference at the top and antiquated information-handling techniques deprive potential users of much of the scientific and technical information (STI) produced with federal support. The technical solution, OTA says, is to go electronic with all data, but a bigger problem is lack of managerial orchestration, for which OTA mainly blames the White House Office of Science and Technology Policy (OSTP). "Congress intended that OSTP be the focal point for STI leadership in the Executive Branch," OTA states, but OSTP "has, in effect, ceded the dominant executive branch policy role to the Office of Management and Budget." OTA's prescription: An assertion of leadership by OSTP, starting with preparation of a government-wide STI strategic plan. The report is a followup to a major OTA study on information policy published in 1988: ***Informing the Nation: Federal Information Dissemination in an Electronic Age*** (GPO Stock No. 052-003-01103-1; 335 pp., $14).

Also from OTA: ***Forest Service Planning: Setting Strategic Direction Under the Forest and Rangeland Renewable Resources Planning Act [RPA] of 1974*** (GPO Stock No. 052-003-01202-2; 140 pp., $6.50), prepared at the request of House and Senate Agriculture Committees and House Interior Committee, says the US Forest Service, part of the Department of Agriculture, has consistently failed to fulfill the 1974 Act's requirements for evaluating forests and rangelands and developing strategies for their protection and sustainability. "Much of the information in RPA documents," OTA states, "is incomplete or of poor quality," resulting "in an ineffective strategic planning process." OTA all but says that the Forest Service's annual report is a sham, noting that it violates many reporting requirements, "and ignores or glosses over most controversies."

Another from OTA: ***Physical Vulnerability of Electric Systems to Natural Disasters and Sabotage*** (GPO Stock No. 052-003-01197-2; 63 pp., $3.75), more alarmist than is customary in the OTA genre, this one notes the monumental disruptions that have resulted from naturally caused power outages, and goes on to speculate that deliberate mischief could shut down major sections of the nation's virtually unprotected electric-supply system. Defense against sophisticated terrorist attack is impractical, OTA says, but protection against amateur assaults is worth the cost, as are planning and preparations for coping with disruptions.

Order OTA publications from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238. (Add 25 percent to price for international orders.)

Energy R&D: DOE's Allocation of Funds for Basic and Applied Research and Development (GAO/RCED-90-1-148-BR; 45 pp., no charge), by the General Accounting Office (GAO), Congressional investigative service, a concise review that shows the pronounced shifts in energy-research spending that occurred under the Reagan Administration's policies of boosting basic research while chopping at Jimmy Carter's programs for renewable-energy and conservation research in the Department of Energy. From 1980-90, DOE's basic-research spending rose from $694 million to $1.7 billion, while solar research declined from $560 million to $90 million and conservation from $295 million to $191 million. During the decade, the GAO reports, the budget share for basic energy research rose from 16 to 41 percent. Without comment, the GAO report states: "According to DOE officials, DOE has no good way to establish budget priorities." But it notes that a "national energy strategy," in the works at DOE, is due for delivery to the White House in December. The GAO report was requested by Chairman Marilyn Lloyd (D-Tenn.) of the Subcommittee on Energy Research and Development, House Committee on Science, Space, and Technology.

Also from the GAO: ***Aerospace Technology: Technical Data and Information on Foreign Test Facilities*** (GAO/NSIAD-90-71FS; 587 pp., no charge), first in what GAO describes as a series of reports on "aerospace investment in foreign countries," this is a big catalog of wind tunnels and other aerospace research facilities around the world, with basic technical data, plus photographs and drawings. The report was requested by Chairman Robert Roe (D-NJ), House Science, Space, and Technology Committee, who has long berated the White House for what he regards as under-investment in aviation, one of the few manufactures in which American exports are internationally dominant.

Order GAO publications from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

1990 IEEE Member Opinion Survey (260 pp., $7.50 for members of the Institute of Electrical and Electronics Engineers; $19.95 for non-members), finds American engineers are anxious about industrial mergers, foreign takeovers, defense cutbacks, and enforced early retirements. This is the sixth biennial sampling of opinions in the IEEE, the world's largest professional society, and the first to include the IEEE's foreign members, who, spread among 130 countries, account for 52,764 of the organization's 260,734 non-student members. The mean income of US members in 1989 was $56,161, plus another $6000 from unspecified sources. Questionnaires covering a variety of professional issues and internal IEEE matters were sent to 2 percent of the US members and 8.7 percent of foreign members and drew responses of about 55 percent from both

(Continued on Page 7)